PATENT
Docket No. 204372000320

CERTIFICATE OF FACSIMILE TRANSMISSION

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Nancy J. Robins

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Lynn E. Spitler et al.

Serial No.: 08/288,057

Filing Date: 10 August 1994

For: PROSTATIC CANCER VACCINE

Examiner: P. Gambel

Group Art Unit: 1816

DECLARATION OF PHILIP O. LIVINGSTON, MD PURSUANT TO 37 C.F.R § 1.132

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

I, Philip O. Livingston, MD, declare as follows:

1. I am a Associate Professor and in charge of the laboratory of Developmental Tumor Vaccinology at Memorial Sloan-Ketter Cancer Center in New York, New York. I am a member of the Scientific Advisory Board for Jenner Technologies, the assignee of this application, and am also a shareholder in the company. A copy of my *Curriculum Vitae* is attached hereto as Exhibit A.

2. I have reviewed the Declaration Under 37 C.F.R. 1.132 prepared by Dr. Lynn E. Spitler describing the results of a clinical study directed to the use of prostate specific antigen

(PSA) as an active ingredient in an antiprostate cancer vaccine. I am also familiar with the study itself, and with the results that were obtained.

3. The purpose of the study was to obtain initial evidence the vaccines would raise a sufficient cellular immune response to have a beneficial effect with respect to prostate tumors. Such a result could be shown directly by measuring cytotoxic lymphocyte (CTL) generation; however, I am aware that this was not possible in these studies because of problems assaying cytotoxic T cell activity. This problem is widespread in the field, despite occasional reports to the contrary, and a lack of sensitive assays for CTL activity is widely considered to be one of the major obstacles to the development of a new generation of vaccines capable of inducing cytotoxic T cells against tumors. This is due to uncertainty over the optimal assay, the optimal time from immunization to blood drawing, and whether testing for CTL activity in the peripheral blood lymphocytes would ever be capable of reflecting the systemic induction of effective CTLs. Consequently, other assays for T cell immunity have been widely used..

4. The responses measured are understood in the art to be satisfactory substitutes for measuring CTLs. Thus, the proliferation of lymphocytes from two of the patients in response to contact with PSA or in response to peptides representing putative PSA epitopes suggests an appropriate cellular immune response. The ability of PSA or PSA derived peptides to stimulate cytokine production -- i.e., gamma interferon and IL-4 production -- from lymphocytes in these patients indicates that the cellular response is obtained specifically with respect to PSA. The observation of the development of a positive skin test response to PSA in one patient is also consistent with these observations showing the development of cell mediated immunity in this patient.

5. In my opinion, the results obtained in this clinical study provide evidence that the vaccines are likely to be effective in exerting a beneficial effect on patients with prostate tumors or at risk for prostate tumors, though much further work will be required to increase the frequency and potency of the responses..

6. The efficacy shown for the vaccine tested in the foregoing clinical studies further provides evidence that analogous vaccines based on host tissue antigen, such as prostate specific membrane antigen (PSMA) and prostate acid phosphatase (PAP) would behave in a similar

manner. It is also well known that if the entire antigen is effective as a vaccine, portions of the antigen will be effective as well, especially if manipulated by art-known methods to enhance their immunogenicity, such as by coupling them to carrier.

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

October 14, 1996 Philip O. Livingston, MD

CURRICULUM VITAE

NAME: Philip O. Livingston, M.D.

DATE OF BIRTH: January 14, 1943

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EDUCATION:

Princeton University, Princeton, New Jersey
B.A. Biology - 1965

Harvard Medical School, Boston, Massachusetts
M.D. - 1969

HOSPITAL APPOINTMENTS:

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Intern 7/1/69 - 6/30/70

Cornell Cooperating Hospitals, New York
Resident 7/1/70 - 6/30/71

New York University Hospital, New York
Fellow - Immunology, 7/1/71 - 6/30/73

U.S. Naval Hospital at Roosevelt Road, Puerto Rico
Lt. Cmdr., Chief of Allergy and Rheumatology Services
1973 - 1975

Memorial Hospital, New York - Fellow -
Department of Medicine - Clinical Immunology Service
7/1/75 - 6/30/77

Memorial Hospital, New York - Assistant Attending
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Exhibit A

HONORS AND FELLOWSHIPS: American Cancer Society Junior Faculty
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PUBLICATIONS:

Livingston, P.O., Shiku, M., Bean, M.A., Pinsky, C.M., Oettgen, H.F. and Old, L.J.: Cell-mediated cytotoxicity for cultured autologous melanoma cells. Int. J. Cancer 24: 34-44, 1979.

Livingston, P.O., Michitsch, R., Shiku, H., Pinsky, C.M. and Oettgen, H.F.: Antibody-dependent cell-mediated cytotoxicity for cultured autologous melanoma cells. Cell Imm. 64: 131-143, 1981.

Pollack, M.S., Livingston, P.O., Fogh, J., Carey, T.E., Oettgen, H.F. and Dupont, B.: Genetically appropriate expressions of HLA and DR (IA) alloantigens on human melanoma cell lines. Tissue Antigens 15: 249-254, 1980.

Pollack, M.S., Heagney, S.D., Livingston, P.O. and Fogh, J.: HLA-A, B, C and DR allogantigens expression on 46 cultured human tumor cell lines. J. Clin. Immunol. 66: 1003-1012, 1981.

Watanabe, T. and Livingston, P.O.: Establishment and maintenance of cultured tumor cell lines and maintenance of cultured amniotic cells for use in HLA typing. IN: AACHT Tissue Typing Manual, Zachary, A.A. and Braun, W.E. (eds.), AACHT, New York, I-21-1 - I-21-4, 1981.

Livingston, P.O., Watanabe, T., Shiku, H., Houghton, A.N., Albino, A., Takahashi, T., Resnick, A., Michitsch, R., Pinsky, C.M., Oettgen, H.F. and Old, L.J.: Serological response of melanoma patients receiving melanoma cell vaccines, I. Autologous cultured melanoma cells. Int. J. Cancer 30: 413-422, 1982.

Livingston, P.O., Oettgen, H.F. and Old, L.J. Specific active immunotherapy in cancer therapy, IN: Immunological Aspects of Cancer Therapeutics, Dr. Enrico Mihich (ed.), John Wiley and Sons, Inc. Publ., 363-404, 1982.

Livingston, P.O., Takeyama, H., Pollack, M.S., Houghton, A.N., Albino, A., Pinsky, C.M., Oettgen, H.F. and Old L.J.: Serological responses of melanoma patients to vaccines derived from allogeneic cultured melanoma cells. Int. J. Cancer 31: 567-575, 1983.

Livingston, P.O., DeLeo, A.B., Jones, M., Oettgen, H.F. and Old, L.J.: Comparison of approaches for augmenting the serological response to the Meth A antigen. Pretreatment with Cyclophosphamide is most effective. J. Immunol. 131: 2601, 1983.

Livingston, P.O., Albino, A.P., Chung, T.J.C., Real, F.X., Houghton, A.N., Oettgen, H.F. and Old, L.J.: Serological response of melanoma patients to vaccines prepared from VSV lysates of autologous and allogeneic cultured melanoma cells. Cancer 55: 713-720, 1985.

Livingston, P.O., Kaelin, E., Pinsky, C.M., Oettgen, H.F. and Old, L.J.: IV. Serological response in stage II melanoma patients receiving allogeneic melanoma cell vaccines. Cancer 56: 2194-2200, 1985.

Livingston, P.O., Jones, M., DeLeo, A.B., Oettgen, H.F. and Old, L.J.: The serological response to Meth A sarcoma vaccines after Cyclophosphamide treatment is further increased by various adjuvants. J. Immunol. 135:1505-1509, 1985.

Livingston, P.O., Old, L.J. and Oettgen, H.F.: Approaches to augmenting the immunogenicity of tumor antigens. IN: Monoclonal Antibodies and Cancer Therapy, UCLA Symposia on Molecular and Cellular Biology, New Series, Volume 27, R.A. Reisfeld and S. Sell (eds.), Alan R. Liss, Inc., New York, N.Y., 537-550, 1985.

Oettgen, H.F., Livingston, P.O., Takahashi, T., Shiku, H., Watanabe, T., Takeyama, H., Houghton, A.N., Albino, A., Resnick, L., Lloyd, K. and Old, L.J.: Specific active immunization against cell surface antigens of human malignant melanoma. Development of an approach. IN: Advances in Immunopharmacology, Hadden, J. (ed.). Pergamon Press, Oxford, 235-242, 1981.

Pollack, M.S. and Livingston, P.O.: HLA and DR antigen frequencies in melanoma patients: Possible relation to disease prognosis. Tissue Antigens 26: 262-265, 1985.

Natoli, Jr., E.J., Livingston, P.O., Cordon-Cardo, C., Pukel, C.S., Lloyd, K.O., Wiegandt, H., Szalay, J., Oettgen, H.F. and Old, L.J. A murine monoclonal antibody detecting n-acetyl and n-glycolyl GM2: Characterization of cell surface reactivity. Cancer Res. 46: 4116-4120, 1986.

Livingston, P.O., Jones Calves, M. and Natoli, Jr., E.J.: Approaches to augmenting the immunogenicity of the ganglioside GM2 in mice: Purified GM2 is superior to whole cells. J. Immunol. 138: 1524-1529, 1987.

Livingston, P.O., Natoli, Jr., E.J., Jones Calves, M., Stockert, E., Oettgen, H.F. and Old, L.J.: Vaccines containing purified GM2 ganglioside elicit GM2 antibodies in melanoma patients. Proc. Natl. Acad. Sci. USA 84: 2911-2915, 1987.

Livingston, P.O., Cunningham-Rundles, S., Marfleet, G., Gnecco, C., Wong, G.Y., Schiffman, G., Enker, W.E. and Hoffmann, M.K.: Inhibition of suppressor cell activity by cyclophosphamide in patients with malignant melanoma. J. Biol. Resp. Mod. 6: 392-403, 1987.

Yamaguchi, H., Furukawa, K., Fortunato, S., Livingston, P.O., Lloyd, K.O., Oettgen, H.F. and Old, L.J.: Cell-surface antigens of melanoma recognized by human monoclonal antibodies. Proc. Natl. Acad. Sci. USA 84: 2416-2420, 1987.

Livingston, P.O.: Experimental and clinical studies with active specific immunotherapy. Immunity to Cancer II, M.S. Mitchell (ed.), Alan R. Liss Inc., New York, N.Y. pp. 309-321, 1989.

Livingston, P.O.: The basis for ganglioside vaccines in melanoma. IN: Human Tumor Antigens and Specific Tumor Therapy, UCLA Symposia on Molecular and Cellular Biology, Volume 99, R. Metzgar and M. Mitchell (eds.), Alan R. Liss, Inc., New York, N.Y. pp. 287-296, 1989.

Livingston, P.O., Ritter, G., Oettgen, H.F. and Old, L.J.: Immunization of melanoma patients with purified gangliosides. IN: Gangliosides in Cancer, H.F. Oettgen (ed.), VCH Verlegsgesellschaft, Weinheim, Germany, pp. 293-299, 1989.

Ritter, G., Livingston, P.O., Boosfeld, E., Wiegandt, H., Yu, R.K., Oettgen, H.F. and Old, L.J. Development of melanoma vaccines: gangliosides as immunogens. IN: Gangliosides in Cancer, H.F. Oettgen (ed.), VCH Verlegsgesellschaft, Weinheim, Germany, pp. 301-313, 1989.

Livingston, P.O., Ritter, G. and Calves, M.J.: Antibody response after immunization with the gangliosides GM1, GM2, GM3, GD2 and GD3 in the mouse. Cancer Immunol. Immunother. 29: 179-184, 1989.

Livingston, P.O., Ritter, G., Srivastava, P., Padavan, M., Calves, M.J., Oettgen, H.F. and Old, L.J.: Characterization of IgG and IgM antibodies induced in melanoma patients by immunization with purified GM2 ganglioside. Cancer Res. 49: 7045-7050, 1989.

Ritter, G., Boosfeld, E., Markstein, E., Yu, R.K., Ren, S., Oettgen, H.F., Old, L.J. and Livingston, P.O.: Biochemical and serological characteristics of natural 9-O-acetyl GD3 from human melanoma and bovine buttermilk and chemically O-acetylated GD3. Cancer Res. 50: 1403-1410, 1990.

Yamaguchi, H., Furukawa, K., Fortunato, S.R., Livingston, P.O., Lloyd, K.O., Oettgen, H.F. and Old, L.J.: A human monoclonal antibody with dual GM2/GD2 specificity derived from an immunized patient. Proc. Natl. Acad. Sci. USA 87: 3333-3337, 1990.

Ritter, G., Boosfeld, E., Calves, M.J., Oettgen, H.F., Old, L.J. and Livingston, P.O.: Antibody response after immunization with gangliosides GD3, GD3 lactones, GD3 amide and GD3 gangliosidol in the mouse. GD3 lactone I induces antibodies reactive with human melanoma. Immunobiology 182: 32-43, 1990.

Livingston, P.O. Active specific immunotherapy in the treatment of cancer. IN: Immunology and Allergy Clinics of North America: Human Cancer Immunology II, H.F. Oettgen (ed.), W.B. Saunders Company, London, U.K., Volume 11:2, pp. 402-423, 1991.

Ritter, G., Boosfeld, E., Adluri, R., Calves, M., Oettgen, H.F., Old, L.J. and Livingston, P.O.: Antibody response to immunization with ganglioside GD3 and GD3 congeners (lactones, amide and gangliosidol) in patients with malignant melanoma. Int. J. Cancer 48: 379-385, 1991.

Ritter, G. and Livingston, P.O.: Cancer associated ganglioside antigens. IN: Seminars in Cancer Biology, M. Longenecker (ed.), W.B. Saunders, London, U.K., Vol. 2: 401-409, 1991.

Oettgen, H.F., Livingston, P.O. and Old, L.J.: Melanoma. IN: Biologic Therapy of Cancer, V.T. DeVita, Jr., S. Hellman, S.A. Rosenberg (eds.), J.B. Lippincott Company, New York, pp. 682-701, 1991.

Goodman, L.A., Livingston, P.O. and Walkley, S.U. Ectopic dendrites occur only on cortical pyramidal cells containing elevated GM2 ganglioside in α-mannosidosis. Proc. Natl. Acad. Sci. USA 88: 11330-11334, 1991.

Livingston, P.O., Koganty, R., Longenecker, B.M., Lloyd, K.O. and Calves, M. Studies on the immunogenicity of synthetic and natural Thomsen-Friedenreich (TF) antigens in mice: Augmentation of the response by Quil A and SAF-m adjuvants and analysis of the specificity of the responses. Vaccine Res. 1: 99-109, 1992.

Steffens, T.A. and Livingston, P.O. The status of adjuvant therapy of melanoma. IN: Surgical Oncology Clinics of North America. W. B. Saunders Company, Philadelphia, Pennsylvania, Volume 1, pp. 307-333, 1992.

O'Boyle, K.P., Zamore, R., Adluri, S., Cohen, A., Kemeny, N., Welt, S., Lloyd, K.O., Oettgen, H.F., Old, L.J. and Livingston, P.O. Immunization of colorectal cancer patients with modified ovine submaxillary gland mucin and adjuvants induces IgM and IgG antibodies to sialylated Tn. Cancer Res. 52: 5663-5667, 1992.

Livingston, P.O. Construction of cancer vaccines with carbohydrate and protein (peptide) tumor antigens. Current Opinion in Immunology 4: 624-629, 1992.

Hamilton, W.B., Helling, F., Lloyd, K.O. and Livingston, P.O. Ganglioside expression on human malignant melanoma assessed by quantitative immune thin layer chromatography. Int. J. Cancer 53: 566-573, 1993.

Livingston, P.O., Calves, M.J., Helling, F., Zollinger, W.D., Blake, M.S. and Lowell, G.H. GD3/proteosome vaccines induce consistent IgM antibodies against the ganglioside GD3. Vaccine 11, 1199-1204, 1993.

Ren, S., Scarsdale, J.N., Ariga, T., Zhang, Y., Slominski, A., Livingston, P.O., Ritter, G., Kushi, Y. and Yu, R.K. Characterization of a hamster melanoma-associated ganglioside antigen as 7-O-acetylated disialoganglioside GD3. J. Lipid Res. 34. 1565-1572, 1993.

Livingston, P.O. Conference Overview. IN: Specific Immunotherapy of Cancer with Vaccines. Annals of New York Academy of Sciences, J.C. Bystryn, S. Ferrone, P.O. Livingston, (eds.), vol. 690, 1-5, 1993.

Livingston, P.O. Approaches to augmenting the IgG antibody response to melanoma ganglioside vaccines. IN: Specific Immunotherapy of Cancer with Vaccines. Annals of New York Academy of Sciences, J-C. Bystryn, S. Ferrone, P.O. Livingston (eds.), vol. 690, 204-213, 1993.

Helling, F., Shang, Y., Calves, M., Oettgen, H.F. and Livingston, P.O. Increased immunogenicity of GD3 conjugate vaccines: Comparison of various carrier proteins and selection of GD3-KLH for further testing. Cancer Res. 54, 197-203, 1994.

Livingston, P.O., Wong, G.Y.C., Adluri, S., Tao, Y., Padavan, M., Parente, R., Hanlon, C., Calves, M.J., Helling, F., Ritter, G., Oettgen, H.F. and Old, L.J. Improved survival in AJCC stage III melanoma patients with GM2 antibodies: A randomized trial of adjuvant vaccination with GM2 ganglioside. J. Clin. Oncol., In Press.

Livingston, P.O., Adluri, S., Hughes, M.H., Calves, M.J., Raychaudhuri, S. and Merritt, J.A. A Phase I trial of the immunological adjuvant SAF-m in melanoma patients vaccinated with the anti-idiotype antibody MELIMMUNE™-1. Vaccine Res., In Press.

Livingston, P.O. Development of generic vaccines for colorectal carcinoma. IN: Cancer of the Colon, Rectum and Anus, A.M. Cohen, S.J. Winawer (eds.), McGraw Hill Inc., New York, In Press, 1994.

Livingston, P.O., Adluri, S., Helling, F., Yao, T-J., Kensil, C.R., Newman, M.J. and Marciani, D. Phase I trial of immunological adjuvant QS-21 with a GM2 ganglioside-KLH conjugate vaccine in patients with malignant melanoma. Vaccine, In Press.

Helling, F., Zhang, A., Shang, A., Adluri, S., Calves, M., Koganty, R., Longenecker, B.M., Oettgen, H.F. and Livingston, P.O. GM2-KLH conjugate vaccine: Increased immunogenicity in melanoma patients after administration with immunological adjuvant QS-21. Submitted.

Adluri, S., Helling. F., Calves, M.J., Koganty, R., Longenecker, B.M., Lloyd, K.O. and Livingston, P.O. Immunogenicity of synthetic TF- and sTn-KLH conjugates in colorectal carcinoma patients. Submitted.

ABSTRACTS

Livingston, P.O., Bean, M.A., Oettgen, H.F. and Old, L.J.: Cytotoxicity (CTX) of melanoma patients' lymphocytes for autologous melanoma cells. Proc. Amer. Assoc. Cancer Res. 18: 95, 1977.

Livingston, P.O., Pinsky, C.M., Oettgen, H.F. and Old, L.J.: Antibody dependent cell mediated cytotoxicity for autologous melanoma. Proc. Amer.Assoc. Cancer Res. 19: 208, 1978.

Livingston, P.O., Shiku, H., Pinsky, C.M., Oettgen, H.F. and Old, L.J.: Effects of autologous melanoma cell vaccine on cell-mediated cytotoxicity for autologous melanoma cells. Proc. Amer. Assoc. Cancer Res. 20: 113, 1979.

Pinsky, C.M., Wittes, R.E., Livingston, P.O., Krown, S.E., Hirshaut, Y. and Oettgen, H.F.: Surgical adjuvant chemotherapy with or without pseudomonas vaccine in patient with stage II malignant melanoma. Proc. Amer. Assoc. Cancer Res. 21: 186, 1980.

Livingston, P.O., Takeyama, H., Houghton, A.N., Albino, A., Pinsky, C.M., Oettgen, H.F. and Old, L.J.: Serological response to vaccination with cultured allogeneic melanoma cells. Proc. Amer. Assoc. Cancer Res. 22: 283, 1981.

Kerr, D., Krown, S.E., Livingston, P.O., Pinsky, C.M., and Oettgen, H.F.: Treatment of melanoma skin metastases with intralesional DNCB. Proc. Amer. Assoc. Cancer Res. 22: 528, 1981.

Livingston, P.O., DeLeo, A.B., Oettgen, H.F. and Old, L.J.: Comparison of approaches for augmenting the serological response to the Meth A antigen. Cyclophosphamide is most effective. Proc. Amer. Assoc. Cancer Res. 24: 196, 1983.

Real, F.X., Mattes, M.J., Houghton, A.N., Livingston, P.O., Lloyd, K.O., Oettgen, H.F. and Old, L.J.: Unique (class 1) tumor antigens of a human melanoma. Serological and biochemical studies. Proc. Amer. Assoc. Cancer Res. 24: 233, 1983.

Livingston, P.O., Hoffmann, M.K., Enker, W.E., Pinsky, C.M. and Oettgen, H.F.: Inhibition of suppressor cell activity in melanoma patients by cyclophosphamide. Amer. Soc. Clin. Onc. 25: 58, 1984.

Livingston, P.O., Jones, M., Oettgen, H.F. and Old, L.J.: Augmentation of the serological response to Meth A antigen by cyclophosphamide and endotoxin. Proc. Amer. Assoc. Cancer Res. 25: 279, 1984.

Livingston, P.O., Jones Calves, M. and Natoli, Jr., E.J.: Approaches to augmenting the immunogenicity of the ganglioside GM2 in mice. Proc. Amer. Assoc. Cancer Res. 27: 1445, 1986.

Natoli, Jr., E.J., Livingston, P.O., Cordon-Cardo, C., Pukel, C.S., Lloyd, K.O., Wiegandt, H., Szalay, J., Oettgen, H.F. and Old, L.J.: Murine monoclonal antibody detecting GM2, a ganglioside expressed by cells of neuroectodermal origin. Proc. Amer. Assoc. Cancer Res. 27: 1444, 1986.

Livingston, P.O., Jones Calves, M., Natoli, Jr., E.J.: Immunization of mice with the gangliosides GD3, GD2, GM3 and GM2. Proc. Amer. Assoc. Cancer Res. 28: 374, 1987.
Livingston, P.O., Ritter, G., Srivastava, P., Padavan, M., Calves, M.J., Oettgen, H.F. and Old, L.J.: Characterization of IgG and IgM antibodies induced in melanoma

patients by immunization with purifed GM2 ganglioside. Amer. Soc. Clin. Onc. 8: 289, 1989.

Ritter, G., Boosfeld, E., Yu, R.K., Oettgen, H.F, Old, L.J. and Livingston, P.O.: Development of melanoma vaccines: immunogenicity of O-acetyl GD3. Proc. Amer. Assoc. Cancer Res. 30: 384, 1989.

Ritter, G., Boosfeld, E., Calves, M.J., Oettgen, H.F., Old, L.J. and Livingston, P.O.: Immunogenicity of GD3 derivatives. Proc. Amer. Assoc.Cancer Res. 31: 279, 1990.

Ritter, G., Yu, R.K., Oettgen, H.F., Old, L.J. and Livingston, P.O.: Immunogenicity of 9-O-acetyl GD3 purified from bovine buttermilk in patients with melanoma. Proc. Amer. Assoc. Cancer Res. 31: 282, 1990.

O'Boyle, K., Cohen, A., Kemeny, N., Enker, W., Sigurdson, E., Welt, S., Lloyd, K.O., Oettgen, H.F., Old, L.J. and Livingston, P. Immunization of colon cancer patients with ovine sialomucin (OSM) containing Tn and sialylated Tn antigens. Amer. Soc. Clin. Onc. 9: 127, 1990.

Livingston, P.O., Koganty, R., Mackie, E., Longenecker, M. and Calves, M. The immunogenicity of synthetic Thomsen-Friedenreich (T) antigen is augmented by covalent attachment to KLH and the use of adjuvants. Proc. Amer. Assoc. Cancer Res. 32: 252, 1991.

O'Boyle, K.P., Zamore, R., Cohen, A., Welt, S., Longenecker, M., Lloyd, K.O., Old, L., Oettgen, H.F. and Livingston, P. Immunization of colorectal cancer patients with OSM vaccine elicits antibodies to sialylated Tn. Proc. Amer. Assoc. Cancer Res. 32: 256, 1991.

Livingston, P.O. Immunotherapy of melanoma and colon cancer with purified carbohydrate vaccines. Proc. Amer. Assoc. Cancer Res. 32: 491, 1991.

Helling, F., Lloyd, K.O., Oettgen, H.F. and Livingston, P.O. Increased immunogenicity of GD3 ganglioside after covalent attachment to proteins. Proc. Amer. Assoc. Cancer Res. 33: 335, 1992.

Hamilton, W.B., Helling, F., Lloyd, K.O. and Livingston, P.O. Ganglioside expression on human malignant melanoma detected by immune thin layer chromatography. Proc. Amer. Assoc. Cancer Res. 33: 335, 1992.

Livingston, P.O., Calves, M.J., Helling, F., Lowell, G.H., Zollinger, W.D. and Blake, M.S. Approaches to augmenting the immunogenicity of GD3 ganglioside in mice: Selection of proteosome vaccines for study in man. Proc. Amer. Assoc. Cancer Res. 33: 335, 1992.